

Water

planning in Lyon County during this phase of the Local Comprehensive Water Plan branches into new areas of opportunity, while facing more pronounced funding challenges.

Opportunities arrive in the form of additional funding sources—primarily the Clean Water Fund initiated by the Clean Water Act amendment in November 2008. This welcome opportunity comes at a time when dollars for water plan funding are being cut back further, which creates a very competitive atmosphere.

Another opportunity for water planning in Lyon County arises with new data, and reports. The Redwood-Cottonwood Rivers Control Area has recently had a TMDL plan approved to address non-point source pollution in the Redwood River watershed. Lyon County has recently purchased rights to two new sources of data; Pictometry, and LIDAR, which will greatly enhance planning precision, and may uncover new opportunities to focus water protection projects.

This amendment to the 2008 local water management plan will cover calendar years 2012-2015. During the next four years, it is hoped these new opportunities outperform the challenges facing local water plan funding—providing greater awareness, protection, and restoration of local water resources.



Implementation Plan Overview

This amendment to the original implementation plan outlines adjustments made to the programs, and activities of this local water plan—though the overarching, target areas of priority concern remain the same. Water Plan Partners have again provided target initiatives that are aligned with the grounding principles established in the original plan:

- a) Activities to be accomplished during active time frame (next four years);
- b) Activities kept to a manageable level to allow for appreciable progress;
- c) Financial exposure limited to what water management plan partners can expect to receive, and distribute; and
- d) Activities complement one another without excessive overlap.

It has been the intent of the local water plan to select priorities that will produce the greatest benefit toward addressing the target issues of priority concern; given the constraints of funding, landowner participation, and jurisdiction. That being said, the water plan team acknowledges that it is essential that this section also be flexible enough to accommodate activities referenced when preparing applications for funding from other sources—aware that this document is referenced when making such financial applications.

Document Layout—Implementation Activities Section

This section of the implementation plan is divided into four areas of primary concern as approved by the Minnesota Board of Water and Soil Resources (BWSR), and includes a fifth area—Education—which supports the other primary concerns. In each priority concern area a brief description of the areas of concern is included along with supporting initiative activities planned, and estimated dollars needed to complete listed initiatives.

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Impaired Waters Reclamation (IWR) Priority Concern Implementation

Several specific surface waters in Lyon County have been determined to be impaired for aquatic life, or human use based on Total Maximum Daily Load (TMDL) assessment. Water Plan Partners charged with administration, restoration, or management of natural resources within these watersheds have provided specific tasks, and solid direction for how to best support implementation activities to aid in recovery efforts of these impaired waters.

What is an Impaired Water?

The federal Clean Water Act requires states to adopt water-quality standards to protect waters from pollution.

These standards define how much of a pollutant can be in the water and still allow that water to meet designated uses, such as drinking water, fishing and swimming.

The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity, and mercury.

A water body is “impaired” if it fails to meet one or more water quality standards. Impaired waters are then included on the federal Section 303(d) Total Maximum Daily Load (TMDL) list of Impaired Waters; commonly referred to as the 303(d) list.

The MPCA—working closely with local Watershed organizations—is responsible for performing TMDL assessments, listing impaired waters, in Minnesota.

Not all surface waters in Lyon County have been thoroughly analyzed. It is hoped that during the span of this water plan update additional efforts will be made to fully assess the current health of all Lyon County water bodies.

Impaired water bodies are listed on the Federal 303(d) list. As this list changes annually, the complete listing of Lyon County impaired waters has been moved to *APPENDIX E: CLEAN WATER ACT SECTION 303(d) LIST*.

In addition to this appendix, the following table lists EPA approved TMDL Projects, and MPCA approved Implementation Plans. Complete TMDL plans are posted on the Minnesota Pollution Control Agency “Impaired Waters & TMDL’s” Section on the PCA website: <http://www.pca.state.mn.us/index.php>

TABLE 1: APPROVED TMDL STUDIES

TMDL Projects	TMDL Approved by U.S. EPA	Implementation Plan Approved by MPCA
Lower Minnesota River TMDL: Low	September 28, 2004	February 2006
Yellow Medicine (South Branch) TMDL: Fecal Coliform Bacteria	September 30, 2004	September 27, 2005
Statewide TMDL: Mercury Pollutant	March 27, 2007	October 2009
W Fork Des Moines River Watershed: Multiple Impairments	December 18, 2008	September 22, 2009

Current TMDL Projects ongoing in Lyon County include the following:

- Cottonwood River - Turbidity
- Cottonwood River - Fecal Coliform
- Redwood River Watershed - Turbidity Assessment and Implementation Plan Development
- Redwood River - Fecal Coliform
- Yellow Medicine (South Branch) - Fecal Coliform
- West Fork Des Moines River Watershed—multiple impairments

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Although not contained within the political boundaries of Lyon County, it is nonetheless important to acknowledge the responsibility of land and water use practices within Lyon County, and how those practices impact downstream recipients. The following TMDL plans have been demonstrated to be in part impacted as a results of Lyon County water, and land use activities.

- Lake Pepin TMDL project
- Lower Minnesota River - Low Dissolved Oxygen

Impaired Waters Restoration (IWR) Priority Concern Implementation

Targeting existing impaired water systems—especially those with TMDL plans—is a top priority for local water planning. The bulk of water planning financial commitment targets preventing nutrient inputs from agricultural waste systems, and non-point sources. Additional, targeted information and education effort are needed to continue to promote stewardship of the land and water resources that make this region so very rich, and wealthy.

To address the array of concerns related to the TMDL Impaired waters listed above, the Lyon County Water Plan will support ongoing efforts of water plan partners addressing TMDL impairments by providing technical assistance, and input to the responsible entities, and by completing initiatives that are complementary to the accomplishment TMDL plan goals, and objectives. Specifically, planned activities, and initiatives that will assist efforts addressing impaired waters priority concerns include the following items:

Impaired Waters Restoration (IWR)	Qty	Cost Per	Total Cost
Work with two (2) animal feedlot operators (less than 500 animal units) per year to correct existing fecal coliform problems.	8	\$ 3,500.00	\$ 28,000.00
Support the development of fifteen (15) nutrient management plans.	15	\$ 250.00	\$ 3,750.00
Identify critical nutrient input points, and install protective grass buffers for sixty (60) total landowners in four (4) years.	60	\$ 1,000.00	\$ 60,000.00
Provide low-interest loan dollars to assist up to thirty (30) landowners with the upgrade of subsurface septic treatment systems (SSTS).	30	\$ 8,500.00	\$ 255,000.00
Conduct four (4) informational sessions to encourage participation in activities aimed at reducing TMDL impairment.	4	\$ 100.00	\$ 400.00
Work with thirty (30) landowner per year to establish best management practices on highly erodeable row cropland.	120	\$ 2,000.00	\$ 480,000.00
Provide low interest loan dollars for conservation tillage BMPs, and equipment.	80	\$ 45,000.00	\$ 3,600,000.00
TOTAL ESTIMATED COST \$ 4,427,150.00			

Cottonwood River Watershed

The Cottonwood River watershed encompasses 1,310 square miles; originating on the Coteau des Prairies, and flowing eastward in similar fashion to the Yellow Medicine, and Redwood Rivers. Rapid transport of sediment and attached nutrients from inadequately maintained cropland during spring snowmelt and spring and summer rainfall events are deemed to be primary factors affecting sediment and excessive nutrient loads of the Cottonwood River watershed.

Nearly all wetlands have been drained by a highly efficient and interconnected artificial drainage system. This drainage system has allowed agriculture, the primary land use, to flourish. Settlement, drainage, and agricultural development also brought about increased flooding and flood damages.

The Cottonwood carries high sediment and phosphorus during the growing season. This is predominantly the result of rainfall-driven polluted runoff that occurs throughout most of the watershed. The lower reach is affected by bacteria, exceeding the *e. coli* bacterium standard, and is subject to a total maximum daily load study (TMDL). The usefulness and aesthetic qualities of the river are impaired, and conditions are unlikely to degrade unless changes are made in land use and water management prac-

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Redwood River Watershed

The Redwood River drops nearly 700 feet in elevation before reaching Marshall at an average of about eighteen feet per mile. The river slope then flattens to an average of about 4 feet per mile between Marshall and Redwood Falls.

Natural drainage patterns in the area were established by river and valleys formed from glacial melt-water, which were formed during the recession of the last glaciers. They form a series of belts that mark some of the river basin boundaries generally running from northwest to southeast. The Redwood River has several segments that do not meet water quality standards according to Section 303(d) of the Federal Clean Water Act includes impairments for aquatic recreation due to excessive E. coli bacteria. Turbidity has also become an impairment for the Redwood River; an implementation plan is currently being developed and is expected to receive approval in latter 2012. Research findings consistently point to sediment loading as a primary problem. The focus within the watershed is on those areas likely to contribute a disproportionate share of the sediment load. Water quality monitoring data, and land uses in selected portions of the watershed were reviewed to select priority implementation areas.

Hydrologic System Management (HSM) Priority Concern Implementation

The Southwest Minnesota landscape has been drastically altered from its native, pre-settlement state. The cumulative, deleterious effects of these alterations have resulted in the rapid transportation of water off the landscape—the result of everything from tiling fields to sewers systems whisking away water that cannot penetrate impervious surfaces.

The amount of water channeled into limited space continues to be a problem that is exacerbated by reduced storage capacity on the land during high-precipitation seasons. Restoration of reclaimable wetlands will be a focal point for educational efforts, and financial incentives during this phase of the local water plan

Slowing this rapid export of water is in need of greater attention through continued implementation of beneficial projects. Some impacts of this human-induced activity can already be seen, such as the impaired list of waters previously discussed. A focal point for activities is the East-West Twin Lakes area.

Water plan partners work diligently to secure additional cooperating landowners for the implementation of projects. Yet even with this diligence, cooperation is not always granted. Nonetheless, water plan partners have identified specific activities which would provide the greatest benefit toward reducing the negative impacts as a result of this rapid export of water.

Hydrologic System Management (HSM)	Qty	Cost Per	Total Cost
Repair and/or install six (6) impoundment structures	6	\$ 14,000.00	\$ 84,000.00
Add 160 acres of native grass, and 40 acres of wetland.	1	\$ 62,000.00	\$ 62,000.00
Inspect eight (8) small dams per year.	8	\$ 1,200.00	\$ 9,600.00
Host wetland reclamation workshop.	1	\$ 500.00	\$ 500.00
Model existing flood control structure benefits, and identify additional flood control opportunities.	1	\$ 2,600.00	\$ 2,600.00
Develop priority list of potential wetland reclamation areas, and contact landowners to assess level of interest.	1	\$ 2,500.00	\$ 2,500.00
Identify target areas for riparian buffering, and surface water protection	1	\$ 2,500.00	\$ 2,500.00
Plan and implement several (2 - 3) conservation drainage pilot projects - i.e. - wood chip bioreactor; controlled drainage infrastructure, etc with willing landowners.	3	\$ 1,700.00	\$ 5,100.00
TOTAL ESTIMATED COST \$			168,800.00

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Nutrient Load Reduction (NLR) Priority Concern Implementation

Protection of watershed systems not currently listed as impaired, and those recovering from recent impairments is an essential component of water resource protection in Lyon County—especially with regard to non-point source pollution potential. Many activities are similar in scope to those used to protect Impaired Waters to avert further degradation of existing marginal water resources.

Nutrient loads into surface waters is a primary culprit for the degradation of water quality. Although some impaired waters have already been identified through TMDL studies, many surface waters have yet to be comprehensively evaluated to ascertain if impairments exist. For this reason, limiting excessive nutrients, such as fertilizer in cities and agricultural lands, from reaching surface waters is of primary consideration throughout the County.

Existing controls are already in place that are designed to address nutrient loading including Subsurface Septic Treatment System (SSTS) compliance inspections, buffer strips along drainage ditch systems, and nutrient management plan requirements for feedlots. However, even with these control, not all situations are adequately addressed, or enforced. Incentives are an important tool for encouraging participation in water resource protection programs.

Nutrient inputs are—of course—major contributor to impairments experienced for all river systems in Lyon County. A primary goal of current TMDL plans are to provide landowners with the tools and assistance they need to reduce nutrient inputs into surface waters.

Nutrient Load Reduction (NLR)	Qty	Cost Per	Total Cost
Install 1 rain garden.	1	\$ 1,200.00	\$ 1,200.00
Replace twelve (12) tile surface intakes per year with sub-surface tile intakes.	48	\$ 300.00	\$ 14,400.00
Assist two livestock producers per year with facility improvements.	8	\$ 4,500.00	\$ 36,000.00
Assist fifteen (15) livestock producers to develop Nutrient Management plans	15	\$ 250.00	\$ 3,750.00
Offer low interest loan dollars to provide the funding needed to complete livestock waste management projects.	1	\$ 200,000.00	\$ 200,000.00
Assist with two (2) grazing management plans per year to protect water sources from livestock access to surface waters.	8	\$ 400.00	\$ 3,200.00
Work with incorporated Municipalities to implement Shoreland BMPs	4	\$ 300.00	\$ 1,200.00
Provide low-interest loan dollars for six (6) livestock facility/equipment upgrades per	24	\$ 65,000.00	\$ 1,560,000.00
Improve upland vegetation at one (1) wetland complex.	1	\$ 6,500.00	\$ 6,500.00
TOTAL ESTIMATED COST \$ 1,826,250.00			

Yellow Medicine Watershed

The Yellow Medicine River watershed drains 100,000 acres in the upper northwestern portion of Lyon County; the river's main stems and tributaries flow down the eastern slope of the Coteau des Prairies. With a majority of the watershed consisting of agricultural land specific problems associated with erosion and sediment control, runoff management, and wetland protection must be addressed. In fact, Section 303 (d) of the Federal Clean Water Act includes the South Branch of the Yellow Medicine River as impaired for aquatic recreation due to *E. coli* bacteria. Flooding, drainage, erosion, sedimentation and poor water quality are considered to be the foremost problems in this watershed.

As in similar watersheds, water quality in streams and lakes is reduced from the sediment, plant nutrients, fertilizer, and other chemicals contained in runoff waters. Cottonwood Lake is also an area of concern, since the MPCA lists swimming activity as "not supported". As development increases along the northern portion of the lake, demand for suitable water quality will no doubt increase; placing more pressure for actions that produce improving results.

Water plan partners are

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Des Moines River Watershed

The West Fork of the Des Moines River originates in Lyon County, southeast of Lake Yankton, yet Lyon County's portion is very small; only 1,323 acres. Assessments of this portion of the Des Moines watershed have been conducted with no portion of the Des Moines in Lyon County listed as impaired source as yet, although MPCA analysis of Lake Yankton is expected to show otherwise. Like other areas of southwestern Minnesota the Lyon County portion of the Des Moines River watershed has been modified by ditches and draining of wetlands for conversion into agriculturally productive land. If we look a bit further south to Lake Shetek in Murray County, we see that numerous problems exist. Assessments of the Lyon County portion of the Des Moines watershed have been conducted with no portion of the Des Moines being listed as having impaired conditions. However, the stretch of the Des Moines from Windom to the southern portion of the watershed is an impaired reach due to excessive ammonia, and turbidity, and low dissolved oxygen.

Since drainage flows from Lyon County, we must take some responsibility for the problem. Lake Yankton has been listed as a hypertrophic lake that does not support swimming. More analysis from the MPCA on Lake Yankton will provide a more clear picture of the current condition of this important surface water resource.

Groundwater Protection (GWP) Priority Concern Implementation

Less emphasis on groundwater protection practices is anticipated during this phase of the water plan. This is primarily due to the completion of the City of Balaton wellhead protection plan, and the lack of future municipal wellhead protection plans until after the next amendment to this plan.

Nonetheless, extensive concern has been expressed with regard to drinking water quality, quantity, and availability in Lyon County. Wellhead protection through land use best management practices in well recharge areas will continue to be emphasized, as will groundwater availability concerns. These two elements in concert produce a greater concern—land use practices that may have future impacts on assuring safe drinking water generations from now.

Activities in this priority concern are expected to be lessened in the next four years as no planned Wellhead Protection plans are scheduled for Lyon County communities. Effort will primarily focus on providing educational opportunities to improve awareness of how residents can implement conservation strategies at home and work.

Groundwater Protection (GWP)	Qty	Cost Per	Total Cost
Provide cost-share to in the seal thirty (30) abandoned wells per year.	120	\$ 130.00	\$ 15,600.00
Review land use controls in areas identified as Wellhead Protection Zones, and place appropriate land use limits where needed.	1	\$ 300.00	\$ 300.00
Assist and support water conservation education efforts; especiall for residents who receive their water from municipal systems.	4	\$ 100.00	\$ 400.00
Provide information and encourage participation in water conservation practices.	4	\$ 75.00	\$ 300.00
Provide low-interest loan funding for 20 SSTS upgrades	20	\$ 8,500.00	\$ 170,000.00
Distribute groundwater BMP information to landowners residing in groundwater vulnerability areas.	2	75 \$	150.00
Support municipal drinking water systems with wellhead protection.	2	\$ 2,000.00	\$ 4,000.00
TOTAL ESTIMATED COST \$			190,750.00

Education Initiatives

Education efforts have been a primary component of local water planning activities in Lyon County, resulting in beneficial partnerships through supporting existing education efforts—especially with Southwest Minnesota State University. Strong support for water resource education in our schools has been demonstrated in the past decade—especially toward middle school age students.

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In this phase of water planning, more attention will be provided toward adult education, while maintaining our strong presence in providing youth water resource education activities. Adult water resource education will take a targeted approach on narrowly-defined topics, for example, wetland reclamation.

Education (ED)	Qty	Cost Per	Total Cost
Support Middle School Science ecology/analysis trips	8 \$	595.00 \$	4,760.00
Distribute shoreland stewardship informational material to property owners annually.	4 \$	75.00 \$	300.00
Host shoreland seminar events to present and encourage protection BMPs	1 \$	200.00 \$	200.00
Distribute water resource protection information twice per year.	6 \$	300.00 \$	1,800.00
Support regional science education events	4 \$	500.00 \$	2,000.00
Conduct water resource protection seminar series (SMSU)	1 \$	500.00 \$	500.00
Conduct conservation drainage workshop	1 \$	500.00 \$	500.00
Support day activity science education	8 \$	450.00 \$	3,600.00
TOTAL ESTIMATED COST \$			13,660.00

Partnerships

Areas of emphasis on behalf of water plan partners is listed on the back cover of this Implementation Plan. The chart identifies the partnering organization, and includes an abbreviated list of intended activities. This reference aid is useful for regular attention to benchmarking activities, and serve as quick access to outside parties as to the best local contact for various activities. This chart also indicates the area of Primary Concern related to that activity. (Note: For space considerations, Education activities are not included on this list).

Concluding Remarks



Rapid changes in availability of data, and additional funding opportunities have helped local water planning efforts to transition toward directing funding at targeted, localized, priority areas that provide a maximum return on investment. Through this amendment to the Lyon County Local Comprehensive Water Plan, It is hoped that additional capacity is developed to make wisest use of accessed dollars.

Challenges certainly face local water planning efforts in the current economy, however, those challenges may very well be opportunities in disguise.

Des Moines River Watershed

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Water Plan Partner Implementation Activity Involvement chart

The chart below summarized primary intended activities, grouped by responsible water plan partner entity. These planned activities may change as local priorities, landowner participation, and funding sources change. The four column groupings to the right identify by three-letter code each of the four Priority Concerns.

Entity	Implementation Activity	IWR	HSM	NLR	GWP
YMRWD	Develop nutrient management plans			X	
	Replace tile surface intakes with sub-surface tile intakes	X		X	
	Install grass buffer			X	
	Assist landowners with the upgrade of subsurface septic treatment systems.				X
RCRCA	Surface tile intake promotion and cost-share assistance	X		X	
	Buffers and Grassed Waterways	X		X	
	Sediment Control Basins		X		
	Work with feedlot operators to eliminate pollution potential	X		X	
Area II	Inspect and repair small dams		X		
SWCD/NRCS	Construct Water & Sediment control basins		X		
	Provide Ag BMP loans for conservation tillage			X	
	Protect waterways, and Support terrace farming		X	X	
	Provide cost share on tile intake conversions			X	
	Provide Ag BMP loans for livestock facility waste management			X	
	Restore wetlands, and protect existing wetland acres from being disturbed		X		
	Provide assistance to upgrade SSTS upgrades				X
	Assist livestock producers to upgrade facilities	X		X	
	Assist with development of grazing management plans			X	
	Environmental	Provide well sealing cost share			
Promote Rain Garden in sensitive areas				X	
Provide SSTS low-interest loans					X
Promote Conservation drainage BMPs			X		
Improve Upland vegetation around wetland					
Work with small feedlot operators to correct existing runoff problems		X		X	
Secure funding to protect East and West Twin Lakes shoreland			X	X	
P&Z	Provide SSTS low-interest loan dollars				X
	Evaluate West Fork Des Moines watershed flood retention capabilities.		X		
	Shoreland stewardship materials will be provided to all shoreland owners		X	X	
Municipals	Distribute water conservation materials				X
	Continue to protect wellhead protection zones				X